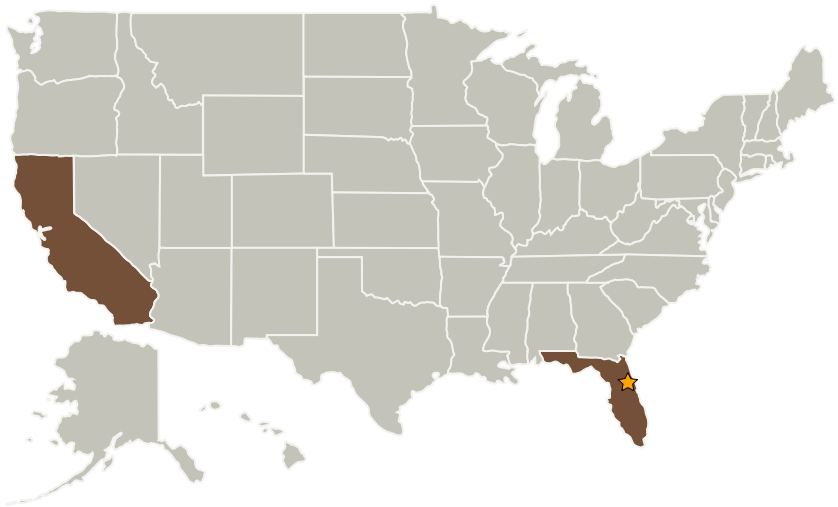
Autonomous, Cryogenic Leak Detector for Improving Launch Site Operations, Phase II

Completed Technology Project (2007 - 2009)

Project Introduction

Spaceports, spacecrafts for planetary missions, future projects on the moon and mars -- they all need to monitor mission critical propellants. This project established the feasibility of a tapered optical fiber-based sensor (TOFS) that can be fitted into narrow orifices of plumbing junctions to detect the leakage of cryogenic fluids such as hydrogen. Complete reversibility and response/recovery time of less than 30 seconds for the hydrogen sensor were demonstrated in Phase I. Scanning electron microscope (SEM) images confirmed that the sensor suffered no degradation upon soaking in liquid nitrogen (LN2, 77 K). Tests with LH2 will be conducted in Phase II. The underlying sensor technology will support NASA goal of reducing vehicle and payload cost, and increase safety of operations by measuring hydrogen in real-time and in situ. A prototype device will be engineered, field-tested and delivered to NASA in Phase II establishing technical maturity approaching TRL 6. InnoSense LLC has received a strong endorsement letter from a major Aerospace company in support of the project. InnoSense LLC has also received Phase III follow-on funding commitment totaling $500,000 from commercialization partners. An engineering team having 80 person-years of cumulative experience in developing commercially viable products has been assembled for this project.

Primary U.S. Work Locations and Key Partners



Autonomous, Cryogenic Leak Detector for Improving Launch Site Operations, Phase II

Table of Contents

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Kennedy Space Center (KSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Small Business Innovation Research/Small Business Tech Transfer

Autonomous, Cryogenic Leak Detector for Improving Launch Site Operations, Phase II

Completed Technology Project (2007 - 2009)

Organizations Performing Work	Role	Type	Location
★Kennedy Space Center(KSC)	Lead Organization	NASA Center	Kennedy Space Center, Florida
Innosense, LLC	Supporting Organization	Industry Minority-Owned Business, Small Disadvantaged Business (SDB), Women-Owned Small Business (WOSB)	Torrance, California

Primary U.S. Work Locations	
California	Florida

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX14 Thermal Management Systems
  - TX14.1 Cryogenic Systems
    - TX14.1.2 Launch Vehicle Propellant